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ENGINEERING DATA TRANSMITTAL

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Page 1 of 1

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1	WHC-SD-EN-SAD-007	N/A	0	Safety Assessment For Drilling New Characterization Boreholes in the 200 West Area	2	2		

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
2 — 1, 2, 3, or 4 see MRP 5.43 and EP-1.7	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

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1	1	Cog./Proj. Eng	V.J. Rohay	1/20/92	H4-56						
1	1	Cog./Proj. Eng. Mgr.	W.L. Johnson	1/20	H4-55						
1	1	QA	D.G. Farwick	1/20	H4-55						
1	1	Safety	D.O. Hess	1/20/92	L6-57						
1	1	NESA	R.D. Lichfield	1/20/92	L6-57						
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Signature
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Organization/Charge Code 29550/PE4AF

7. Abstract

The attached document is the safety assessment for drilling new characterization boreholes in support of the Carbon Tetrachloride Expedited Response Action.

APPROVED FOR PUBLIC RELEASE
2/13/92 N. Solis

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9. Impact Level
2

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1.0 INTRODUCTION AND SUMMARY

Westinghouse Hanford Company (Westinghouse Hanford) is planning to drill new wells in the 200 West Area at the Hanford Site for additional site characterization. Figure 1 provides a basic site and 200 West Area orientation. This activity is defined as the Phase II Site Evaluation for the 200 West Area Carbon Tetrachloride Expedited Response Action that the U.S. Department of Energy, the U.S. Environmental Protection Agency and the Washington State Department of Ecology agreed in late 1990 to undertake at Hanford. This activity will involve drilling four new wells for characterization purposes and for potential remediation use. This assessment only addresses construction and sampling of new wells and does not include use of these wells for vapor extraction operations.

This document records the results of the safety assessment for drilling and sampling new characterization wells in the 200 West Area. This assessment includes an evaluation of the potential intrinsic hazards associated with this activity along with a summary of the hazard analysis. Included are recommended controls to assure that this activity can be conducted within the bounds of the assessment.

The activities associated with the installation of new wells (site preparation, drilling, sampling, disposal, handling of any potentially radioactive or non radioactive hazardous materials) will be addressed in the Environmental Investigations and Instructions (EII) contained in the Environmental and Site Characterization Manual (WHC 1989).

The requirements for determination of hazard classification indicates that this activity will require review and approval for a general use operation. This safety assessment satisfies the requirements of WHC 1988, WHC 1990a, and DOE Order 5481.1B, "Safety Analysis and Review System" (DOE 1988). The hazard classification criteria for this activity complies with the procedural criteria of WHC 1988 and is consistent with the guidance in WHC 1990a. Onsite and offsite criteria for general use is <0.1 of the immediately dangerous to life and health limit (<30 p/m CCl_4) WHC 1990a and <time weighted average (<2 p/m CCl_4) WHC 1988 respectively.

2.0 DISCUSSION

2.1 PURPOSE

The purpose of this activity is to obtain data on the nature and distribution of contaminants in the subsurface and to provide additional access to stratigraphic intervals isolated to optimize remediation efficiency.

2.2 TASK DESCRIPTION

The four new wells will be vertical wells drilled outside of known surface or subsurface radiation zones. The wells are sited in the vicinity of the three carbon tetrachloride (CCl_4) disposal sites (Figure 2). During this

Figure 1. Hanford Site Map and Location of the 200 West Area.

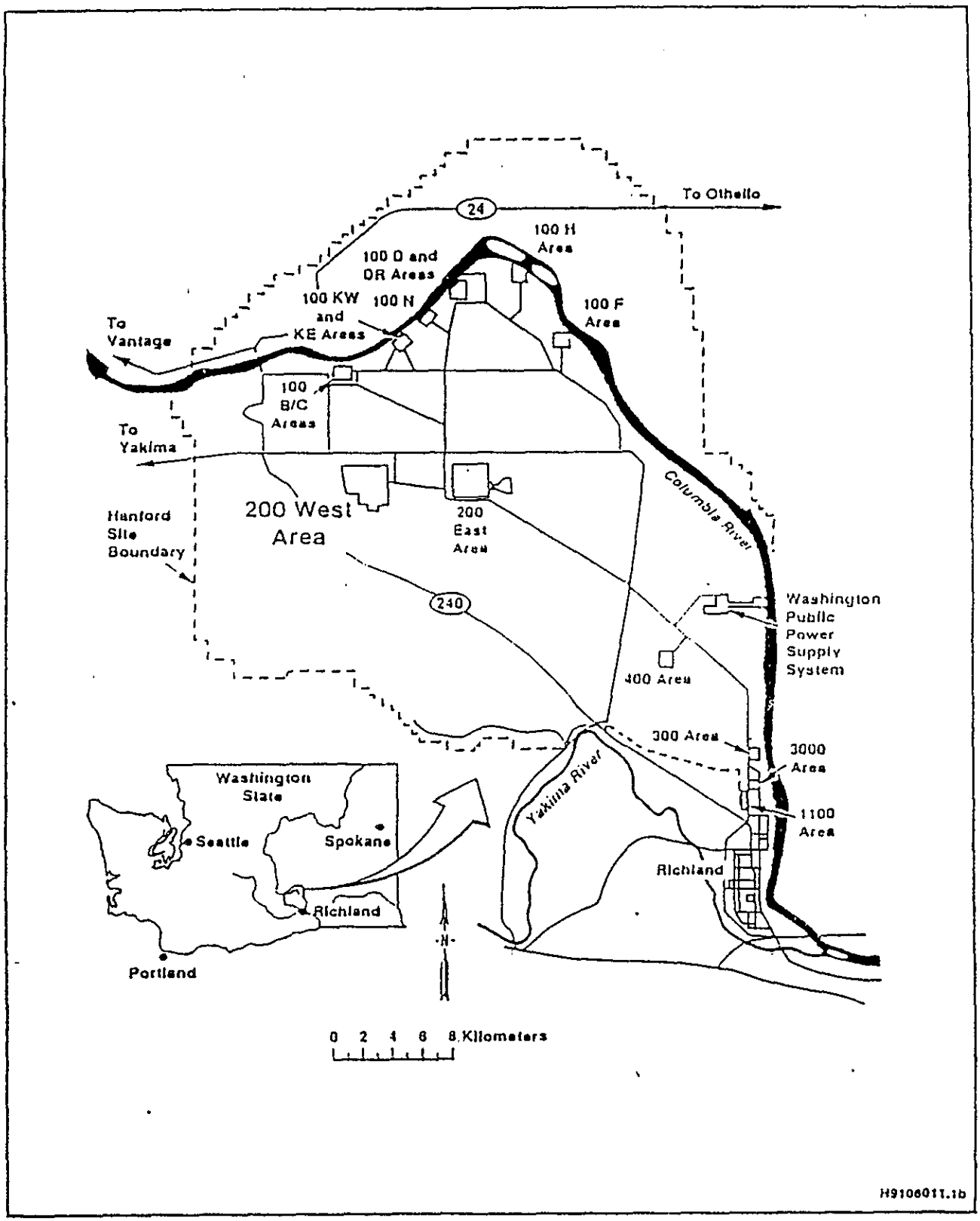
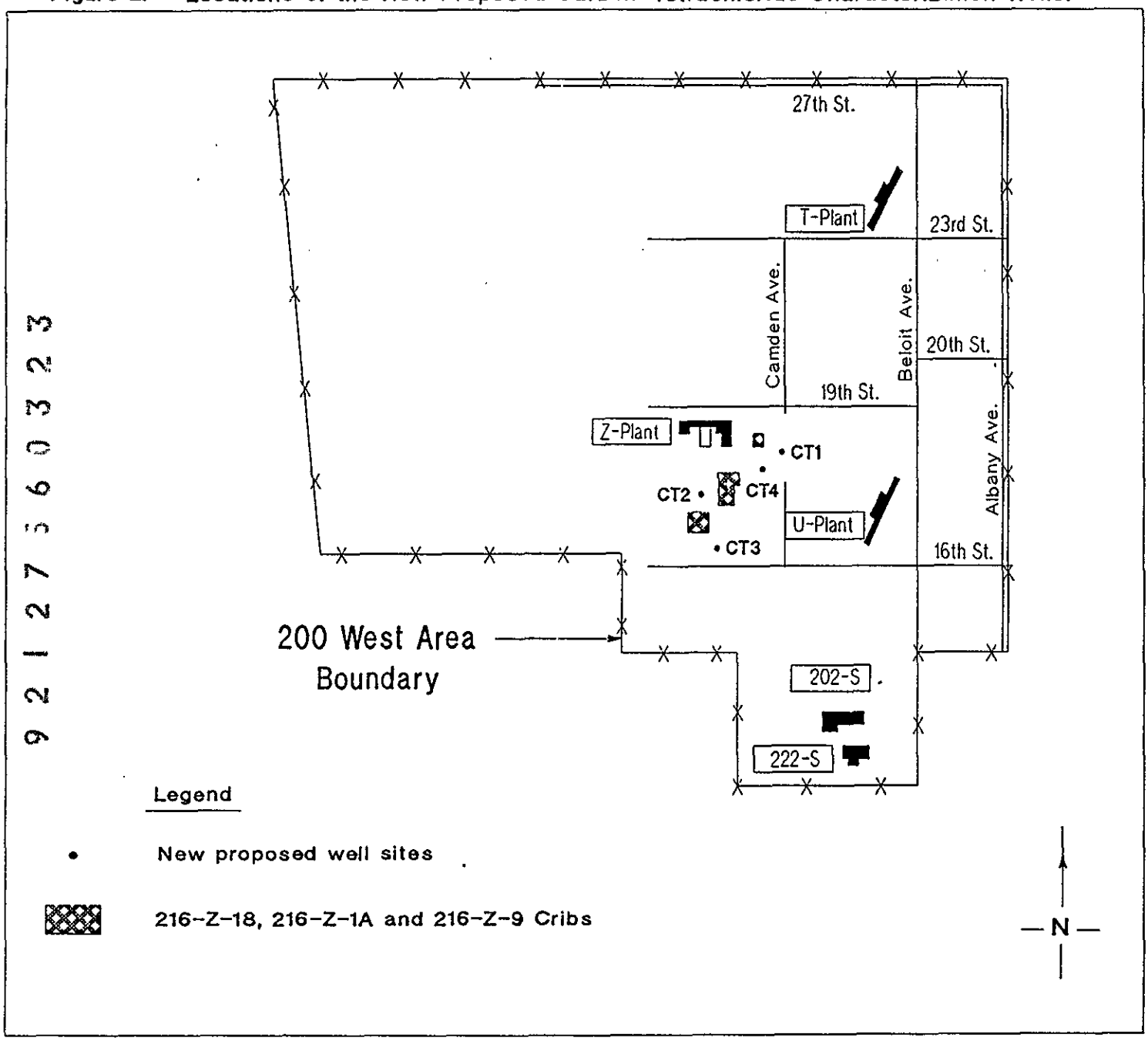


Figure 2. Locations of the New Proposed Carbon Tetrachloride Characterization Wells.



phase of site evaluation, the locations will be selected primarily to provide characterization data.

One well (CT4) will be drilled to the top of the basalt at a depth of 525 ft (160 m). This well is intended to characterize the distribution of CCl_4 within the unsaturated zone and the unconfined aquifer. The well is sited south of the 216-Z-9 Trench, midway between wells 2-W15-8 and 2-W15-5. During Phase I Site Evaluation, data from well 2-W15-6 at the 216-Z-9 Trench indicated that CCl_4 was contaminating the aquifer to depths of at least 165 ft (50 m) below the water table (DOE-RL 1991). The mechanism by which CCl_4 reached the deep aquifer is uncertain. The new well will also be used to determine if the existing well casing at 2-W15-6 provided a preferential pathway.

Three other wells (CT1, CT2, and CT3) will be drilled to 15 ft (5 m) below the water table at a depth of approximately 200 ft (60 m). These wells are intended to characterize the distribution, nature, and transport of CCl_4 within the unsaturated zone. During Phase I Site Evaluation, it was determined that CCl_4 vapors had been detected above the Plio-Pleistocene unit to the west and south of the 216-Z-1A Tile Field during drilling activities (DOE-RL 1991). The top of the Plio-Pleistocene forms an apparent local ridge that runs south-southwest underneath the three disposal sites. The three new wells are sited to investigate whether CCl_4 liquid and/or vapor is draining by density transport down the slopes of this ridge. One well will be approximately 150 ft (45 m) west of 216-Z-1A, with another well approximately 230 ft (70 m) southeast of 216-Z-9. Another well will be south of 216-Z-1A, approximately 200 ft (60 m) southeast of 216-Z-18.

The installation (drilling) of the new wells will be with cable-tool or sonic drill rigs using the techniques and equipment as required by EII 6.7 (WHC 1991a). All materials produced from this work effort (cuttings, spoils, fluids, purgewater, etc.) shall be periodically monitored with field instrumentation for volatile organics and other chemical constituents. Containment of material, if required, will be conducted per 4.2 (WHC 1991d).

During drilling of all four wells, the unsaturated soil will be sampled in situ for soil vapors at the end of each day if the hole was advanced 5 ft (1.5 m), a significant lithologic boundary is penetrated, or a zone of increased moisture was encountered. The soil vapors will be analyzed for volatile organic compounds (VOC) (including CCl_4 and chloroform) using a portable gas chromatograph or photoionization detector. Approximately six to twelve 2 ft (0.6 m) long core samples per well will be collected from the unsaturated zone to characterize in the laboratory the concentrations of contaminants, values of physical or hydrologic parameters, and/or nature of microbial populations. The intervals to be sampled will be contingent in part on the observed concentrations of in situ soil gas vapors and in part on the observed variation of geologic layering.

Ground water samples will be collected at all four wells. In the three unsaturated zone wells, samples will be bailed at the water table and at approximately 5, 10, and 15 ft (1.5, 3 and 5 m) below the water table. The samples will be analyzed for VOCs in a laboratory or by using a portable gas chromatograph. During drilling of the deep well within the aquifer, samples of the slurry will be screened every 5 ft (1.5 m) using a headspace analysis.

Split-spoon samples will be taken whenever the vapor concentrations in the slurry indicate the possibility of the presence of a nonaqueous phase. The split-spoon samples will be analyzed in the laboratory for volatiles, semivolatiles, tributyl phosphate, dibutyl phosphate, dibutyl butyl phosphonate, and alpha activity. During the drilling of the deep well, ground water samples will be collected every 20 ft (6 m).

Soils containing hazardous waste (including soil or ground water samples) and purge water will be collected or contained, stored, treated and/or disposed of in accordance with the requirements in EII 5.2 and EII 5.8 (WHC 1990b;WHC 1991e).

All four wells will be constructed using techniques designed to prevent cross-contamination or the introduction of contaminants to deeper levels. A schematic of a near field characterization and vadose zone monitoring well is shown in Figure 3. Actual screened intervals will be determined based on contaminant concentrations observed during drilling.

2.3 SUMMARY OF SOIL PHYSICAL CHARACTERISTICS

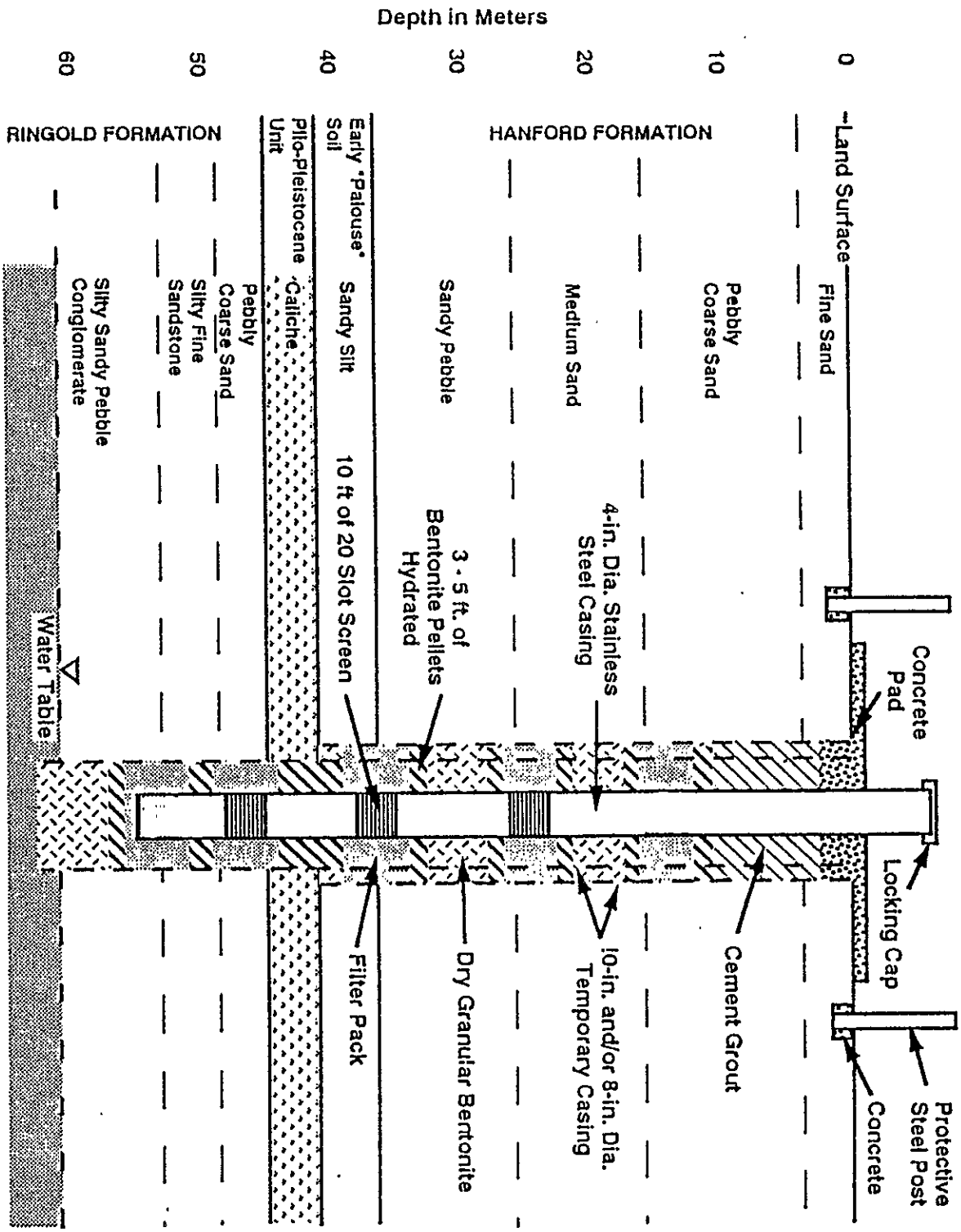
The geology of the 200 West Area consists primarily of basalts overlain by fluvial and glaciofluvial sediments. The following are the sediments, from the oldest to the youngest:

- Ringold Formation - a series of alluvial sands and gravels, and overbank and lacustrine deposits of late Miocene to Pliocene age.
- Plio-Pleistocene unit - basaltic detritus and a carbonate-rich paleosol (often referred to as the caliche layer).
- Early Palouse Soil - eolian silt and fine-grained sand.
- Hanford formation - glaciofluvial gravels, sands, and silts deposited by middle to late Pleistocene cataclysmic flood waters.

Local structural features in the vicinity of the 200 West Area include the Cold Creek syncline and the Gable Butte-Gable Mountain extension of the Umatanum Ridge anticline. The 200 West Area is located on the northern flank of the Cold Creek syncline which dips at about 5 degrees to the south. No faults have been identified beneath the 200 West Area.

The uppermost aquifer in the 200 West Area is unconfined and located within the Ringold Formation. The depth to the water table ranges from 190 to 270 ft (58 to 82 m). Beneath the CCl_4 disposal sites, the depth to ground water ranges from 197 to 217 ft (60 to 66 m). The saturated thickness of the uppermost aquifer ranges from 220 to 370 ft (67 to 113 m). Ground water velocities are estimated to range from < 0.3 to 154 ft/d (<0.1 to 47 m/d). Ground water flow directions are generally radial outward from the southwest portion of the 200 West Area primarily because of the continuing influence of the residual ground water mound underlying the decommissioned 216-U Pond. Recharge to the aquifer is primarily artificial recharge from waste disposal activities. The emergency, process, and drinking water comes from the Columbia River.

Figure 3. Schematic of a Near Field Characterization/Monitoring Well.



The vadose zone consists of sediments of the Ringold Formation, Plio-Pleistocene unit, early Palouse soil and Hanford formation. The vadose zone ranges in thickness from 190 to 270 ft (58 to 82 m). Within the vadose zone, the Plio-Pleistocene unit (caliche layer) is less permeable than the other units which may result in slower travel times through this unit or perched ground water or vapor. The vapor extraction tests indicate that the air permeability of the Hanford formation is 2×10^{-8} to 5.6×10^{-8} cm^2.

3.0 HAZARDS

3.1 BASIS FOR HAZARDS CONSIDERED

An evaluation of the intrinsic hazards associated with drilling and sampling operations for the new wells and potential consequences were evaluated. Accident conditions, including natural phenomena events, were considered. The intrinsic hazards and potential accidents provide the bounding envelope for potential consequences.

The predominant events evaluated were those that could cause radiological or nonradiological contaminants to become airborne, resulting in consequences to the occupational, uninvolved worker and offsite receptors. Events also were evaluated that could cause contaminants to be released that may result in an environmental insult.

The scope of this activity addresses nonradiological contaminants in the soil that will be removed and purge water/ground water samples brought to the surface.

There are few conditions where sufficient energy is available to support airborne releases of potential purge water/ground water sample contaminants. The contaminant levels are of negligible toxicity (other than CCl_4) concern or radiological concern. Consequently, there are negligible hazards or only commonly accepted risks regarding the purge water/ground water activities.

3.2 SUMMARY OF CONTAMINANT CHARACTERISTICS

The CCl_4 vapor concentrations detected (in the unsaturated soils) in a pilot test in April 1991 at the 216-Z-1A Tile Field indicated that the peak vapor concentration observed was 915 p/m from a depth of 115-138 ft (35-42 m). Soil gas samples were obtained in November of 1991 by using a soil gas probe (cone penetrometer) installed close to well 299-W15-6 at the 216-Z-9 Trench. The maximum measured CCl_4 vapor concentration from a depth of 65 ft (20 m) was 6,000 p/m.

In addition to the CCl_4, other organic compounds, including tributyl phosphate, dibutyl butyl phosphonate, and the degradation products chloroform and dibuytl phosphate, may also be present in the soils.

Away from the three disposal sites, CCl_4 vapors have been detected during drilling throughout the 200 West Area at concentrations ranging from less than detectable to approximately 60 p/m. The other VOC contaminants away from the three disposal sites have been observed in trace amounts in sediment samples. Other substances have also been identified in trace amounts. The

maximum concentrations of these substances (other than CCl_4) are identified to be in the ng/g or p/b ranges (Attachment A). Even if some of these contaminants are removed during drilling or sampling, the CCl_4 threshold limit values are more restrictive and are therefore bounded by the CCl_4 analysis.

The ground water underlying the CCl_4 disposal sites is contaminated with CCl_4, chloroform, cyanide, tetrachloroethylene, trichloroethylene, methyl ethyl ketone, and uranium. The maximum concentrations of CCl_4 detected in groundwater samples was only 3 p/m near the cribs.

The removal of radionuclides is not anticipated because the drilling and sampling activities will be conducted outside of surface or subsurface contamination zones and areas.

3.3 CREDIBLE SCENARIOS ANALYZED

There is one scenario postulated and analyzed that could cause a release of contaminants to the environment. The analysis of the hazard inventory and potential release mechanism indicated that CCl_4 vapors could be released to the atmosphere as discussed in Section 3.5.

The evaluations determined that natural forces events (i.e., earthquake, high wind, flood and fire) represent no health or environmental significance. The potential physical damage to the drilling structures and materials would, at worst case, promote the dispersal of only negligible residual substances that are not in a readily dispersable form.

The potential for criticality was evaluated and determined not to be credible since the drilling activities will be conducted in areas that are not radiation zones/areas and where no fissionable/fissile materials are present.

There were other events that were considered credible but would not result in any change in the impact of the event on the receptor groups and environment, and therefore, would not require any further evaluation.

3.4 THRESHOLD VALUES

The inventory and source term analyzed was for CCl_4. Other VOCs were analyzed as indicated in Section 3.2, paragraph 2. The criterion values for the chemical contaminant CCl_4 are provided in Table 1. These limits were derived from the guidelines using the concentration values reported in the Occupational Safety and Health Administration, Department of Labor standards (OSHA 1989).

Table 1. Criterion Values.

Contaminant	IDLH p/m	TWA p/m	TWA mg/m^3
CCl_4 *	300	2	12.6

IDLH = The Immediately Dangerous to Life or Health level represents a maximum concentration from which one could escape within 30 minutes without any escape-impairing symptoms or any irreversible health effects.

TWA = The Time Weighted Average concentration limit for a normal 8-h workday and a 40-h workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse health effect (The term "TWA" may be expressed in either p/m or mg/m_3).

* Ca = Any chemical designated as "Ca," is considered to be a chemical that should be treated as an occupational carcinogen (NIOSH 1990c).

3.5 ASSESSMENT RESULTS

This assessment postulated a scenario involving the release of CCl_4 due to a sampling pump operating continuously at a maximum flow rate of 1 l/m. The concentrations of CCl_4 assumed to be released was based upon the maximum concentrations detected during the cone penetrometer tests (as discussed in Section 3.2). The maximum concentration found was 6,000 p/m. This postulated scenario assumes the maximum concentrations of CCl_4 as the source term in this analysis. This scenario bounds any unacceptable consequences involving the release of soil gas from the soil as it is removed from the borehole.

The WHAZAN Buoyant Plume model was used for the dispersion calculations to calculate downwind concentrations (Attachment B). A summary of the receptor exposures is provided in Table 2.

Table 2. Receptor Exposures for 8 hr Release of CCl_4.

Hazard Source Inventory	Resultant Exposures		Limits	
CCl_4	Onsite 60 m	Offsite 4 km	Onsite 60 m	Offsite 4 km
1 l/m	0.29 p/m 1.9 mg/m^3	0.009 p/m 0.58 mg/m^3	<30 p/m <192 mg/m^3	<2 p/m <12.6 mg/m^3

4.0 CONCLUSIONS

The analysis disclosed that drilling and sampling of the new wells would be classified as a general use activity. The hypothetical release concentrations (exposures to the onsite and offsite receptors) were found to be less than the deminimus levels for general use activities provided by Westinghouse Hanford in Implementation Guideline for Hazard Documentation (WHC 1990a). Even though there are no exposure limits established for the occupational worker in WHC 1990, this assessment evaluates the potential hazards that may affect the occupational worker and provides limits and controls to assure this activity can be conducted safely.

To assure that exposures to the occupational worker and other receptors of concern are maintained as low as reasonably achievable (ALARA) and the activity can be operated as a general use activity, an Operational Safety Limit (OSL) has been established. Prudent actions have also been recommended to limit exposures to the occupational worker below the TWA of 2 p/m during the drilling, sampling and monitoring activities.

5.0 OPERATIONAL SAFETY LIMIT

An OSL is an auditable limit established within WHC for the safe operation of a nonreactor nuclear facility or activity. The Department of Energy Field Office Richland (DOE-RL) has a policy that at least one safety control will be established to assure the facility or activity is performed safely and within the bounds of the safety documentation. The following is an OSL for the drilling of the new wells identified in this assessment.

5.1 OPERATIONAL SAFETY LIMIT

This OSL applies to the drilling of the new wells identified in this assessment.

5.1.1 Title: Concentrations of CCl_4 shall not exceed 25 p/m for more than 30 min in ambient air at the work site.

5.1.2 Applicability: This limit applies to monitoring CCl_4 concentrations in the workers' breathing zone during sampling and drilling operations.

5.1.3 Objective: This limit was established to minimize potential consequences to the nearest uninvolved and site workers during the drilling and sampling operations.

5.1.4 Requirement: The ambient air around the drilling and sampling equipment shall be monitored during periods of drilling and sampling to assure the concentrations of CCL_4 does not exceed 25 p/m for more than 30 min in the workers' breathing zone.

5.1.5 Surveillance: The responsible operating organization shall verify monitoring operations are conducted during drilling and sampling operations.

5.1.6 Recovery:

5.1.6.1 Non-compliance with the requirements of the OSL:

1. In the event that detected concentrations of CCl_4 exceeds 25 p/m for more than 30 min (as detected in ambient air) sampling and drilling activities shall cease. Notification to the appropriate Health and Safety Assurance and Environmental Engineering management is required. Approval for restart of operations will be required by Health and Safety Assurance.

2. The OSL violation will be documented as an unusual occurrence report.

5.1.6.2 Non-compliance with the surveillance requirements:

1. The surveillance shall be performed immediately.

2. If surveillance determines noncompliance with the requirement then initiate recovery actions as identified in Section 5.1.6.1.

3. Failure to implement a surveillance requirement shall be documented as an off-normal occurrence.

5.1.7 Audit Point: An auditable log shall be maintained at the site daily documenting (during periods of operation) the results of the surveillance.

5.1.8 Basis: The maximum concentration of 25 p/m for not more than 30 min was established for the purpose of providing an indication of an increase in concentrations of CCl_4 in close proximity to the work site. This limit assures that the uninvolved and site workers would not be exposed to concentrations of CCl_4 that could result in unacceptable consequences.

6.0 PRUDENT ACTIONS

Function

Minimize exposures to occupational workers to ALARA.

Prudent Action

Monitor ambient air for CCl_4 vapors in areas where workers will be required to perform their work activities. Concentrations detected that exceed the TWA 2 p/m limit will require removal of personnel from the work area or donning of supplied air and other appropriate protective gear as required by the HWOP.

Function

Sampling operations.

Prudent Action

Sampling operations should be in compliance with the appropriate Hazardous Waste Operations Permit HWOP.031 (WHC 1991c), Radiation Work Permit RWP D-KEH-T-064 (WHC 1991b), EII 5.2, "Soil and Sediment Sampling," (WHC 1990b) and EII 5.8, "Groundwater Sampling," (WHC 1991e).

Function

Monitor site for potential radionuclides.

Prudent Action

Even though radioactive contamination is not expected (new wells will not be drilled in surface or subsurface areas), monitoring should be conducted to assure all equipment is free of any contamination and can be released from the area.

7.0 REFERENCES

DOE-RL, 1991, "*Expedited Response Action Proposal for the 200 West Area Carbon Tetrachloride Plume*," DOE/RL-91-32, Draft B, U.S. Department of Energy Field Office, Richland, Washington.

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WHC, 1991c, Hazardous Waste Operation Permit "*Carbon Tetrachloride Disposal 200 West*," HWOP.031, Westinghouse Hanford Company, Richland, Washington.

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OSHA, 1989, "*Occupational Safety and Health Administration, Department of Labor*," Code of Federal Regulations, 29 CFR, Part 1910.1000.

ATTACHMENT A

CONCENTRATIONS OF CONTAMINANTS IN 200 WEST AREA SOILS

ATTACHMENT A

Other soil contaminants which have been encountered in the 200 West Area are listed below. For each contaminant the maximum observed concentration is indicated. However, the contaminant may have been detected in other wells or at other depths at a lower concentration.

Maximum Observed Concentrations in 200 West Area Soils

acetone	0.01 micrograms/g at 126 foot depth in W15-21
benzene	approximately 380 ng/g atg 180 foot depth in W15-20
bromodichloromethane	0.2 ng/ml at 220 foot depth in W22-40
chlorobenzene	approximately 13 ng/g at 180 foot depth in W15-20
chloroform	187 ng/g at 180 foot depth in W15-20
1,2-dichloroethane	approximately 26 ng/g at 220 foot depth in W15-21
1,1-dichloroethylene	approximately 457 ng/g at 180 foot depth in W15-20
cis-1,2-dichloroethylene	approximately 78 ng/g at 180 foot depth in W15-20
trans-1,2-dichloroethylene	approximately 440 ng/g at 180 foot depth in W15-20
ethyl benzene	approximately 3 ng/g at 220 foot depth in W15-21
fluoromethane	approximately 3500 ppb/g at 200 foot depth in W7-9
trichlorofluoromethane	approximately 1600 ng/g at 160 foot depth in W7-7
methylene chloride	1749 ng/g at 180 foot depth in W15-20
methyl isobutyl ketone	approximately 190 ng/g at 190 foot depth in W26-8
tetrachloroethylene	10 ng/g at 190 foot depth in W26-8
toluene	1648 ng/g at 190 foot depth in W26-8
1,1,1-trichloroethane	99 ng/g at 190 foot depth in W26-8
trichloroethylene	10 ng/g at 190 foot depth in W26-8
m- and p-xylene	40 ng/g at 5 foot depth in W7-7
o-xylene	35 ng/g at 220 foot depth in W7-9

ATTACHMENT B

CONSEQUENCE ANALYSIS FOR CARBON TETRACHLORIDE CONTINUOUS RELEASE SCENARIO

W H A Z A N

Data Input

Effective Release Height (m)	< .0 - 1.00E+03> (.0)	: 0
Release Rate (kg/s)	< 1.00E-03 - 1.00E+04> (None)	: 1.43 *
Release Duration (sec)	< 1.000 - 1.00E+06> (None)	: 10000
Min Conc of Interest (ppm)	< 1.00E-03 - 1.00E+05> (None)	: 2
Wind Speed (m/s)	< 1.00E-01 - 50.00> (3.000)	: 1
Ambient Temperature (K)	< 200.0 - 400.0> (293.0)	: 298
Surface Roughness Parameter	< 1.00E-02 - .400> (1.00E-01)	:
Atmospheric Stability Category	< A - F > (D)	: F

Are Data OK <Y or N> (Y) :

* Source term is factor of 10000 too large. (This is necessary because of input limits of model.) Calculated answers will be divided by 10000.

Source Term Calculation

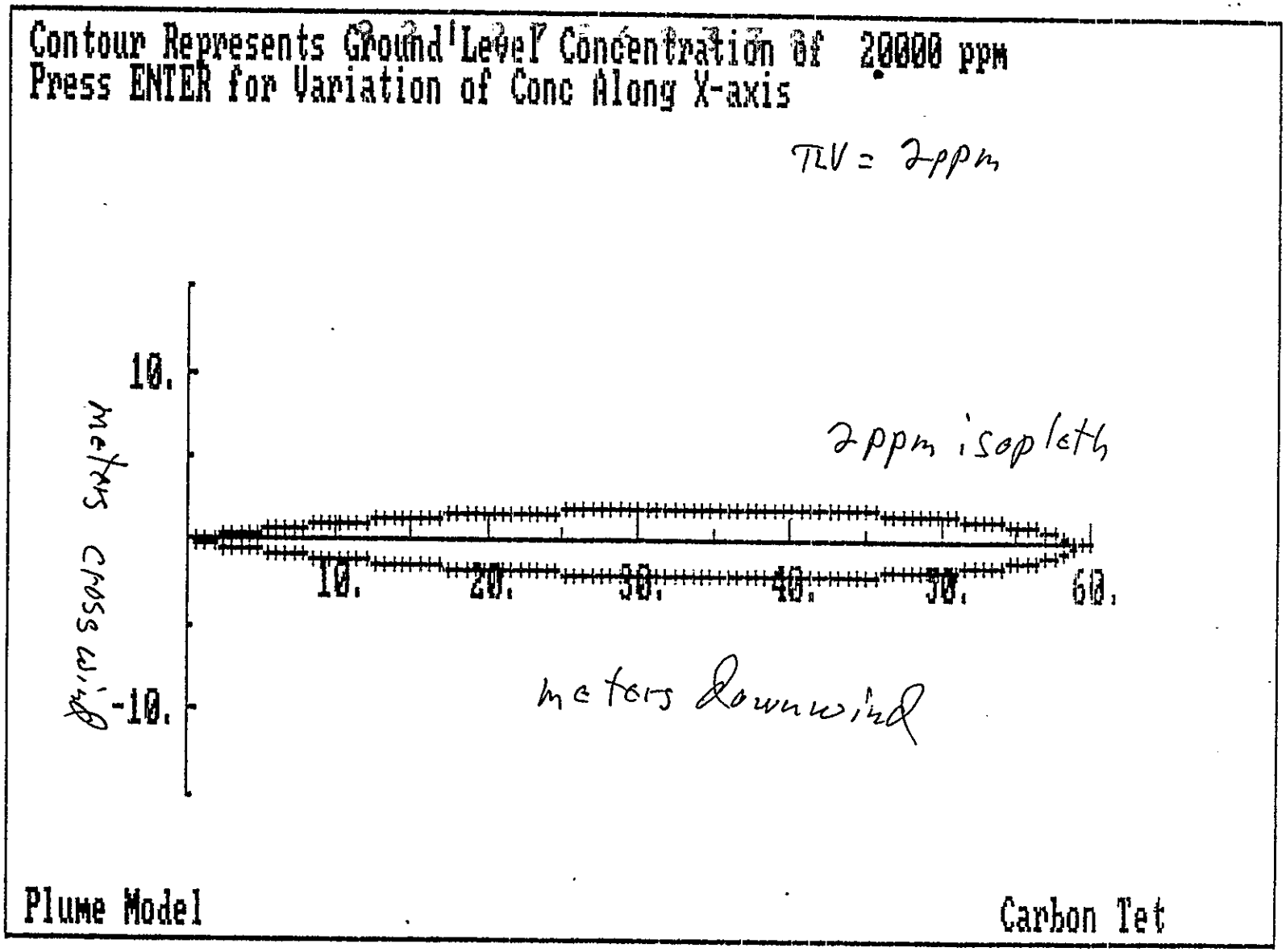
molar volume @ 25°C = 24.4 ℓ/mole

Conc = 6000 ppm CCl_4

$$\frac{(ppm)(M.W.)}{\text{molar volume}} = \frac{(6000)(154)}{24.4} = 37{,}865 \text{ mg/m}^3 = 37.865 \text{ mg/ℓ}$$

flow rate = 8 scfm = 226.5 ℓ/m

$$(37.865 \text{ mg/ℓ})(226.5 \text{ ℓ/m}) = 8576 \text{ mg/m} = 143 \text{ mg/s} = 1.43 \times 10^{-4} \text{ kg/s}$$


Contour Represents Ground Level Concentration of 20000 ppm
Press ENTER for Variation of Conc Along X-axis
TLV = 2ppm
10.
-10.
meters cross wind
2ppm isopleth
10.
20.
30.
40.
50.
60.
meters downwind
Plume Model
Carbon Tet

W H A Z A N Plume Model

Date 18-DEC-1991 Time 9: 18

Data Used in Calculations

Chemical - Carbon Tet

Height (m)	= .0
Release Rate (kg/s)	= 1.430
Concentration of Interest (ppm)	= 2.00E+04
Wind speed (m/s)	= 1.000
Ambient Temperature (K)	= 298.0
Surface Roughness Parameter	= 1.00E-01

inputs

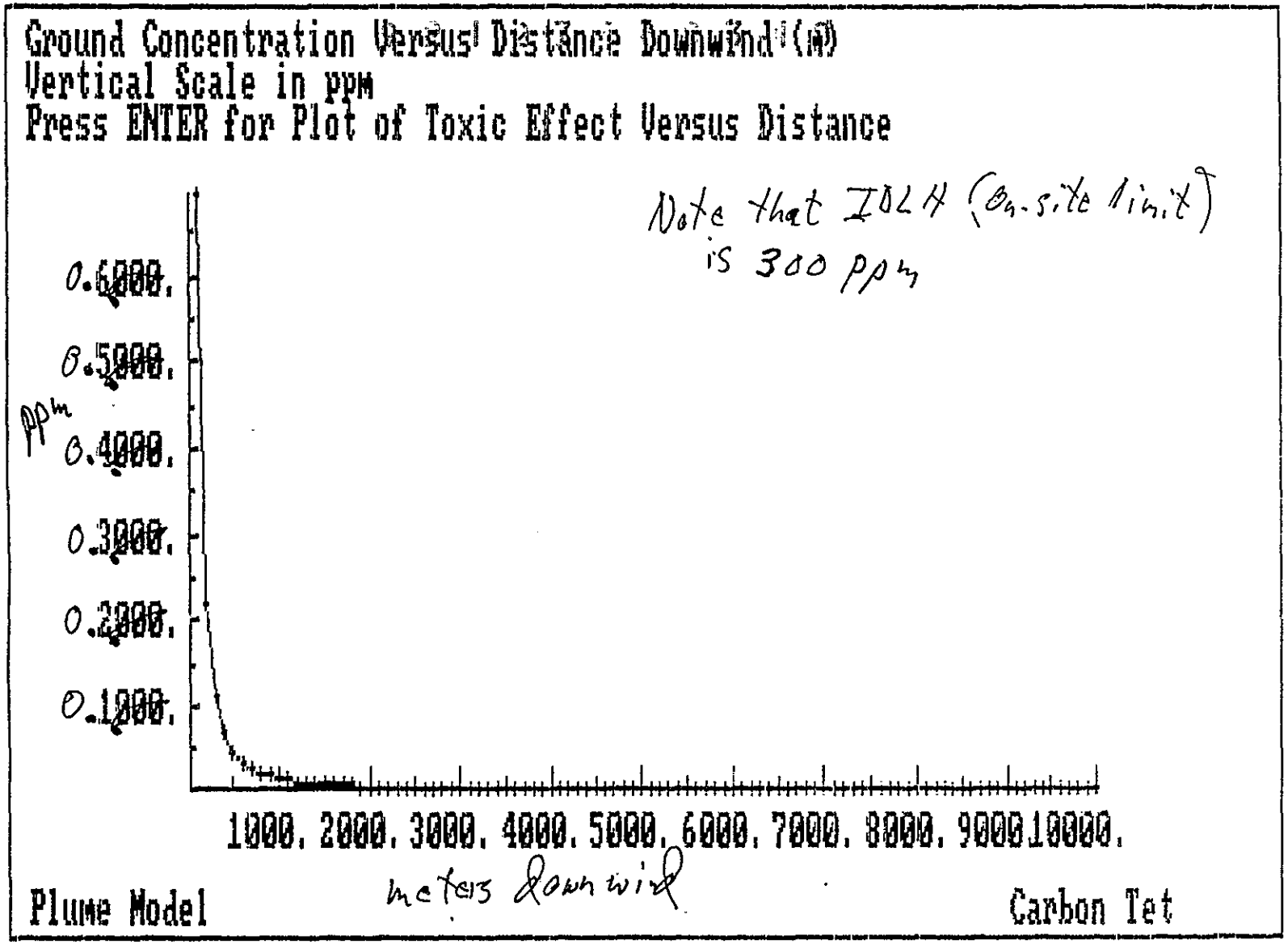
Results

Max Downwind Effect Distance (m)	= 60.00
Max Crosswind Effect Distance (m)	= 2.016
Max Concentration at Ground (ppm)	= 1.00E+06
Max Toxic Effect (Prob of Fatality)	= 1.000

calculated results

Continue or Store Data (C or S) :

9213639


Ground Concentration Versus Distance Downwind (m)
Vertical Scale in ppm
Press ENTER for Plot of Toxic Effect Versus Distance
Note that IDLH (on-site limit) is 300 ppm
ppm
0.6000.
0.5000.
0.4000.
0.3000.
0.2000.
0.1000.
1000. 2000. 3000. 4000. 5000. 6000. 7000. 8000. 9000 10000.
meters downwind
Plume Model
Carbon Tet

INFORMATION RELEASE REQUEST

References: WHC-CM-3-4

COMPLETE FOR ALL TYPES OF RELEASE

Purpose

[]	Speech or Presentation		[]	Reference
	[] Full Paper	(Check only one suffix)	[X]	Technical Report
	[] Summary		[]	Thesis or Dissertation
	[] Abstract		[]	Manual
	[] Visual Aid		[]	Brochure/Flier
[]	Speakers Bureau		[]	Software/Database
[]	Poster Session		[]	Controlled Database
[]	Videotape		[]	Other

New ID Number: WHC-SD-EN-SAD-007, Rev. 0

Existing ID Number (include revision, volume, etc.):

If previously cleared, list ID number:

Date Release Required: 2/3/92

Title: Safety Assessment for Drilling New Characterization Boreholes in the 200 West Area

Unclassified Category: UC- N/A

Impact Level: 2

COMPLETE FOR SPEECH OR PRESENTATION

Title of Journal: N/A

Group or Society Sponsoring: N/A

Date(s) of Conference or Meeting: N/A

City/State: N/A

Will proceedings be published? [] Yes [X] No

Will material be handed out? [] Yes [X] No

Title of Conference or Meeting: N/A

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[]	[X]			
Patent - General Counsel	[X]	[]	BD Williamson	BD Williamson	1/28/92
Legal - General Counsel	[X]	[]	BD Williamson	BD Williamson	1/28/92
Applied Technology/Export Controlled Information or International Program	[]	[X]			
WHC Program	[]	[X]			
Communications	[]	[X]			
DOE-RL Program	[]	[X]			
Publication Services	[]	[X]	D. E. Smith	DE Smith	2/3/92
Other Program	[]	[X]			
References Available to Intended Audience	[X]	[]	W. L. Johnson	WL Johnson	1/27/92
Transmit to DOE-HQ/Office of Scientific and Technical Information	[]	[X]			

Information conforms to all applicable requirements. The above information is certified to be correct.

Author (Requestor) (Printed/Signature): W. L. Johnson — Date: 1/27/92

WL Johnson 1/27/92

Responsible Manager (Printed/Signature): M. R. Adams — Date: 1/27/92

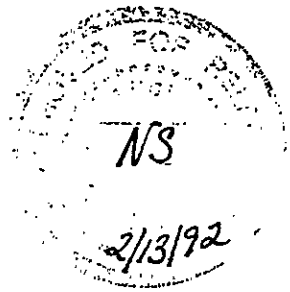
MR Adams

Intended Audience

[] Internal [] Sponsor [X] External

INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP

Stamp is required before release. Release is contingent upon resolution of mandatory comments.



Date Received: 1-27-92

DISTRIBUTION SHEET

To:	From:	Date:
Distribution	R. R. Lehrschall	1/20/92

Project Title/Work Order:

Safety Assessment for Drilling New Characterization Boreholes in the 200 West Area
WHC-SD-EN-SAD-007, Rev. 0

EDT No.: 129410 ECN No.:

Name	MSIN	With Attachment	EDT/ECN & Comment	EDT/ECN Only
M. R. Adams (3)	H4-55	X		
D. G. Farwick (2)	H4-16	X		
K. D. Gibson	H5-31	X		
M. C. Hagood	H4-55	X		
D. O. Hess	L6-57	X		
N. R. Kerr	B1-35	X		
W. L. Johnson	H4-55	X		
R. R. Lehrschall (3)	B1-35	X		
R. D. Lichfield	L6-57	X		
R. W. Perusse	H4-16	X		
V. J. Rohay	H4-56	X		
A. R. Schade	B1-35	X		
T. M. Wintczak	L4-92	X		
J. J. Zimmer	N1-83	X		
EDMC (2)	H4-22	X		
IRM Clearance	H4-17	X		
Central Files	L8-04	X		